

# **A Population Viability of Bull Trout Living Within the Hells Canyon Reach of the Snake River Basin—Using a BayVAM Assessment**

## **(E.3.1-7) Chapter 2**

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### **I. Introduction**

This report summarizes the discussions that took place during the two-day workshop and the results of the BayVAM assessment. The workgroup discussed the viability of populations currently found in the Pine and Indian creek drainages that are tributary to Hells Canyon Reservoir. The population was broken down into five discrete local populations: 1) Upper Pine Creek, 2) Clear Creek, 3) East Pine Creek, 4) Elk Creek, and 5) Indian Creek.

*“The purpose of conducting the BayVAM exercise was threefold: first, to use the process structure of the BayVAM analysis (as outlined by Lee and Rieman 1997 and described in detail by Lee et al. 2000) to promote an exchange of information across a variety of organizations; second, to use the gaming process to identify management scenarios that are most likely to change fish population trends; and third, to establish a biological rationale to guide prioritization of research and management strategies that are likely to assist recovery of fish populations.” (Page 3, Paragraph 2)*

### **II. Conclusions**

1. *“Based on the understanding of the Working Group, there is a very high risk of a single catastrophic event eliminating any one of the five local populations. All of the local populations appear to be very small, resident populations relying on very small, isolated spaces. Any activity that increases the frequency or magnitude of catastrophic events will increase the chance of stochastic extinction.” (Page 35, Paragraph 1)*

Response: The BLM agrees with this finding.

2. *“.... providing for one to six fish immigrating annually increased population persistence more than any other variable did. Providing for this immigration requires management practices that promote movement among the local populations, either within Pine Creek or between Pine and Indian creeks.” (Page 35, Paragraph 2)*

Response: The BLM agrees with this statement. It is implied that irrigation diversions and de-watering of streams in the Pine Creek drainage would need to be corrected.

3. *“Being able to promote movement within the basin will require taking into account habitat conditions in the migratory corridors of Pine Creek, Indian Creek, and the Hells Canyon Reservoir. The stream segments that provide the migration corridors in Pine Creek typically exhibit seasonal intermittency or thermal barrier characteristics that appear to be caused largely by anthropogenic change.” (Page 35, Paragraph 2)*

Response: The BLM agrees with this statement. The streams in the Pine Creek watershed have been greatly modified by agriculture and irrigation. However, the greatest anthropogenic change was caused by the construction of the Hells Canyon Dam. It is believed that bull trout populations were reasonably healthy in these watersheds prior to the dam closure, which eliminated fluvial bull trout.

4. *“Migratory corridors in Indian Creek appear to have more favorable conditions than those in Pine Creek because intermittency is not reported and, while water temperatures warm, temperatures do not appear to be lethal.” (Page 35, Paragraph 2)*

Response: The BLM agrees with this statement.

5. *“The Hells Canyon Reservoir achieves lethal temperatures during the summer each year. Yet some movement in the reservoir has been recorded during summer. An investigation of the distribution and size of thermal refuges in the reservoir could substantively assist in understanding the reservoir as a migration corridor.” (Page 35, Paragraph 2)*

Response: The BLM agrees with this statement. However, the Applicant should work to improve the thermal regime of the Hells Canyon Reservoir.

6. *“Potential Recommendations*
  - *Confirm the age at first maturity and the average fecundity of bull trout.*
  - *Determine the location of nursery areas used by those individuals that use the Hells Canyon Reservoir during some part of their lives.*
  - *Determine whether any actions can be taken that will increase the suitable habitat available to bull trout in nursery areas.*
  - *Determine whether any actions can be taken that will enhance the opportunity for bull trout to move among populations within Pine Creek.”**(Page 35, Paragraph 3)*

Response: The BLM agrees with these recommendations.

### **III. Study Adequacy**

The study follows the BayVAM analysis procedure and is a detailed and factual representation of the BayVAM workshop conducted at Copperfield, Oregon.

### **IV. BLM Conclusions and Recommendations**

#### Conclusions

The BLM should accept this study. It was conducted by a private consultant with the participation of federal and state fisheries agencies. The BayVAM process guided the participants through a series of logical steps to reach a conclusion concerning the survival of bull trout in Pine and Indian Creek drainages. It was concluded that bull trout have a high probability of extinction within the next 100 years if management measures are not implemented to change the current trend.

Although bull trout have been affected by the agricultural and irrigation practices in Pine Creek watershed, bull trout were relatively abundant before the closure of the Hells Canyon Dam. It is probable that fluvial bull trout moved into the watershed during high spring flows before irrigation began and moved out of the watershed after the end of the irrigation season. Therefore, the anthropogenic impact in Pine Creek on bull trout may have been relatively limited compared to the impact of the Hells Canyon Dam that completely blocked bull trout from entering Pine and Indian creek watersheds.

#### Recommendations

1. The BLM should recommend that the Applicant implement the study recommendations.
2. Additionally, the Applicant should carry out whatever measures necessary to reduce the lethal summer temperatures in the Hells Canyon Reservoir.
3. The Applicant should be required to fund efforts to continue the necessary research and management needed to reduce the threat of extinction for these five local populations. The BayVAM analysis indicates that addition of migrating fish to each of these watersheds would minimize the extinction threat. The existence of the Hells Canyon Dam has prevented the migration of fluvial bull trout into these watersheds.
4. The Applicant should consider measures to restore bull trout in Eagle Creek, a tributary of Brownlee Reservoir. Eagle Creek creel surveys found bull trout present until the early 1980s. The blockage of fluvial Snake River fish migration into the drainage likely contributed to their extirpation.
5. The Applicant should fund studies to determine whether remnant populations of bull trout are still present in the Eagle Creek watershed. Although efforts have been made to find bull trout in Eagle Creek, they have been relatively limited surveying areas easily accessible by vehicle. Many miles of the drainage are located in roadless wilderness areas that have not been sampled.